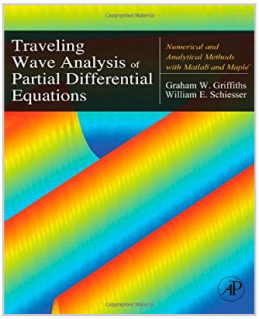

Traveling Wave Analysis of Partial Differential Equations: Numerical and Analytical Methods with Matlab and Maple

By Graham W. Griffiths, William E. Schiesser

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Although the Partial Differential Equations (PDE) models that are now studied are usually beyond traditional mathematical analysis, the numerical methods that are being developed and used require testing and validation. This is often done with PDEs that have known, exact, analytical solutions. The development of analytical solutions is also an active area of research, with many advances being reported recently, particularly traveling wave solutions for nonlinear evolutionary PDEs. Thus, the current development of analytical solutions directly supports the development of numerical methods by providing a spectrum of test problems that can be used to evaluate numerical methods.

This book surveys some of these new developments in analytical and numerical methods, and relates the two through a series of PDE examples. The PDEs that have been selected are largely "named" since they carry the names of their original contributors. These names usually signify that the PDEs are widely recognized and used in many application areas. The authors' intention is to provide a set of numerical and analytical methods based on the concept of a traveling wave, with a central feature of conversion of the PDEs to ODEs.

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Editorial Review

Review

"This book surveys some of the new developments in analytical and numerical computer solution methods for partial differential equations with applications to physical, chemical, and biological problems. The development of analytical solutions directly supports the development of numerical methods by providing a spectrum of test problems that can be used to evaluate numerical methods."--**Zentralblatt MATH 1228-1**

About the Author
Graham W. Griffiths is a visiting professor in the School of Engineering and Mathematical Sciences of City University, London. He is also a founder of Special Analysis and Simulation Technology Ltd. and has worked extensively in the field of dynamic simulation of physical and chemical processes.
William E. Schiesser is the Emeritus R. L. McCann Professor of Chemical Engineering and a Professor of Mathematics at Lehigh University. He is also a visiting professor at the University of Pennsylvania and the co-author of the Cambridge book Computational Transport Phenomena.

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